

## **REMARKS**

### **Pending Claims**

Claims 1, 2, 3, 7, 8, 15, 17, and 19-22 have been amended. Claims 4, 5, 6, 16, 18, and 23-24 have been cancelled. New claims 25- 30 have been added. Accordingly, claims 1-3, 7-8, 15, 17, 19-22, and 25-30 are pending in this Application.

### **Claim Rejections – 35 USC § 103**

The Office Action noted for the record that the Examiner assigns a broad interpretation to the terms “harmony,” “melody,” and “chord.” Applicants remind the Examiner that in applying the prior art, the claims should be construed to encompass all definitions that are consistent with applicants' use of the term and the pending claims must be given the broadest reasonable interpretation consistent with the specification.

Claims 1-24 are rejected under 35 USC 103 (a) as being obvious over Dunn’s “Inflections: Music from DNA (1992-1995)” in view of Long (GB 2,350,469 A). As discussed with the Examiner during the recent telephonic interview, Dunn describes a melody that is determined in response to a sequence of amino acids encoded by selected DNA. The harmony of the melody is fixed, is arbitrarily chosen by a human composer, and is unrelated to the DNA or amino acid sequences. For example, the melodic scale tones chosen by the composer appear to be major pentatonic scales that do not change, such as the wind blowing a wind chime.

In contrast to Dunn, the claimed invention determines a harmony for each amino acid. For example, a type of chord is first determined from the chemical property of an encoded amino acid, and then a series of chord tones is selected using the encoding nucleotides. Thus, a melody

is determined from the sequence of the selected harmonic chord tones as well as from individual nucleotides that encode each determined amino acid.. Each of harmony and melody change; harmony changes with each changing amino acid, and melody changes with each changing nucleotide and with each encoding amino acid. Such is not taught or suggested by the cited references, alone or in combination.

Regarding claims 1, 8, 14-19, and 23, Dunn in view of Long fails to teach a harmonic and/or music sequence generator as claimed.

The Office Action states that while Dunn's written disclosure is silent to distinguishing between melodic and harmonic generation, it is clear, that by listening to Dunn's (and Bridge's) compositions (available on the internet), that both harmony and melody are "transcribed" from the DNA sequences. Dunn's compositions are polyphonic (containing three voices) wherein each voice plays a note that is determined by a single amino acid. It is significant that the instrumentation (i.e., which instruments are chosen) and rhythm have been determined by a human composer (apparently Bridges in this case) because the duration of the notes (and the change of the spectral content over time) of a note played by an instrument determines any perceived harmony with respect to other voices. Thus, the perceived harmony results from notes overlapping each other, with the overlap being chosen by a human composer.

As discussed above, Dunn does not teach or fairly suggest generating a melodic sequence in response to a received harmonic sequence. Instead, Dunn generates three melodies that, arguendo, produce a harmony. However, Dunn can only select 5 notes per instrument per received nucleotide, and thus any harmony is accidental and not generated. In claim 8, a

melodic sequence is generated in response to a plurality of determined chords. Again Dunn does not teach or fairly suggest a melody being derived from determined chords.

Furthermore, Long does not overcome Dunn's deficiencies. Long merely teaches sounding chords and arpeggios in accordance with amino acids. Like Dunn, Long at least does not teach or fairly suggest the melodic sequence being generated in response to a received harmonic sequence. Combining Dunn with Long would not have led to the claimed invention because Dunn and Long, either individually or in combination, at least do not teach, fairly suggest, or disclose generating a melodic sequence in response to a plurality of determined chords.

The Office Action asserts that generating a melody based on harmony would certainly be within the scope of one of ordinary skill and that this is the technique used throughout the era of common practice [by humans]. The alleged motivation for combining "melody and harmony generation" is that Western music has employed harmony and melody to achieve desired emotional expression for hundreds of years. Applicants note that the alleged motivation is not directed to claim differences (such as, generating a melodic sequence in response to a received harmonic sequence) and is merely directed towards combining harmony and melody generation. Furthermore, the motivation apparently is directed towards human efforts because, as alleged, Western music has employed harmony and melody for hundreds of years (which is longer than the time frame of musical DNA transcription by machines).

Furthermore applicants maintain their belief that the rejections are based upon impermissible hindsight general motivation reasoning and that the proposed modification is not

addressed towards claim differences. The motivation is too general because achieving emotional expression by employing harmony and melody in Western music for hundreds of years would contemplate almost any alteration of Dunn for achieving emotional expression and does not address why generating a melodic sequence in response to a plurality of determined chords would be obvious. The rejection is believed to be based on hindsight reconstruction because “generating a melodic sequence in response to a plurality of determined chords” is not taught or fairly suggested outside the applicants’ disclosure. As noted above, neither Dunn nor Long teaches the generating a melodic sequence in response to a plurality of determined chords. Applicants refer the Examiner to the applicants’ response to the former §112 rejection for claim 7 for an example of a melody being chosen in response to a determined chord.

In view of the above amendments and remarks, applicants respectfully submit the claims are in condition for allowance. Notice of Allowance is respectfully requested. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

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